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THE SPECTRUM OF NOVA MONOCEROTIS

Two photographs of the spectrum of Nova *Monocerotis* were obtained with the 60-inch reflector and the Cassegrain spectrograph on the nights of February 28th and March 1st under rather unfavorable observing conditions. The first photograph was made with a 7-inch and the second with an 18-inch camera. One prism was used in both cases.

The negatives are somewhat underexposed but show the following bright bands: $H\epsilon$, $H\gamma$, 4363, 4640, $H\beta$, 4959 and 5007. A trace of 4686 is also present. The bands have the characteristics so familiar in the spectra of temporary stars, great width and diffuseness with broad faint absorption lines superposed upon the bright bands. Of the two maxima thus formed, the violet is the stronger, particularly in the case of the lines due to nebulium. The hydrogen bands are more nearly symmetrical.

A comparison of these photographs with those of Nova *Geminorum* No. 2, made in 1912, shows marked similarity to those obtained six weeks after the discovery of the latter. The bands in Nova *Monocerotis* are somewhat wider and more diffuse, and the lack of symmetry in the bands of nebulium is more marked. An interesting difference is seen in the structure of the hydrogen bands. In the case of Nova *Geminorum* these are stronger on the red side, while in Nova *Monocerotis* the violet side is slightly more intense. The faint helium lines present in the spectrum of Nova *Geminorum* are not seen in the other star.

W. S. ADAMS,
A. H. JOY.

Mount Wilson Solar Observatory,
March 14, 1918.

THREE ADDITIONAL NOVAE IN THE ANDROMEDA NEBULA

Since the announcement in the December number of these PUBLICATIONS of a fifth nova in the *Andromeda* nebula (N. G. C. 224), three additional novae have appeared in this nebula.

A negative taken with the 60-inch reflector November 14, 1917, shows Nova No. 5 to have faded to magnitude 19. On this negative Nova No. 6 was discovered, magnitude 16.8; the distance from the nucleus is approximately 275″ north and 165″ east.

A photograph taken December 12th shows Nova No. 6 to have faded to magnitude 17.6. A very sharp negative taken on the following night shows the same nova of magnitude 17.8; Nova No. 5 is invisible on this fine plate. Two negatives taken by Mr. Shapley on December 9 and December 19 show Nova No. 6 with magnitudes 17.5 and 18.4, respectively.

A photograph taken January 15, 1918, with poor seeing, shows Nova No. 6 near the limit of visibility, its magnitude certainly below 19. On this plate Nova No. 7 was discovered, magnitude 17.1; its position is approximately 11″ north and 143″ west of the nucleus of the nebula. A photograph taken on January 17 by Mr. Shapley confirms this discovery; on the latter date the magnitude was 17.3.

A photograph taken February 9, 1918, with poor seeing, fails to show Nova No. 7 with certainty. The result was unexpected, since no other nova found in the spiral nebulae has faded so rapidly. Nova No. 8 was discovered on this negative; its magnitude was 17.7 at discovery; its position is approximately 46″ south and 115″ west of the nucleus of the nebula. A photograph taken February 10th with fine seeing still failed to show Nova No. 7 with certainty; its magnitude was therefore probably below 19.5. Nova No. 8 remained at magnitude 17.7.

The exposure time for each of the negatives referred to above was about 70 minutes.

The numbers used in the foregoing discussion refer to the novae found in the *Andromeda* nebula in the order of discovery. No. 1 is that discovered in August, 1885; Nos. 2 and 3 are those found last August on Mount Wilson photographs taken in September, 1909; No. 4 is that discovered by Shapley on September 11, 1917, and No. 5 was found October 16, 1917.

G. W. Ritchey.

The Small Nebulous Ring About Nova Persei

A photograph of Nova *Persei* taken with the 60-inch reflector on November 15, 1917, shows very strongly the small nebulous ring about the star, which was discovered October 16th, and announced in the December number of these Publications. The ring is so small and faint that a fine-grained plate (Seed 23) was used, and an exposure of 5½ hours was given; atmospheric conditions were very fine.

The photograph confirms the earlier one, showing a continuous ring about 17″ in diameter, nearly round, with the nova at its